What is claimed is:

1. A zeolite bound zeolite catalyst which does not contain significant amounts of non-zeolitic binder and comprises:

(a) first crystals of a large pore size first zeolite selected from the group consisting of MAZ, EMT, MEI, and MOR, and

(b) a binder comprising second crystals of a second zeolite.

2. The catalyst recited in Claim 1, wherein said second crystals are intergrown and form at least a partial coating on said first crystals.

3. The catalyst recited in Claim 2, wherein said first crystals of said first zeolite have an average particle size greater than about 0.1 micron and said second crystals of said second zeolite have an average particle size that is less than said first crystals of said first zeolite.

4. The catalyst recited in Claim 3, wherein said catalyst is prepared from a silica bound extrudate comprising said first crystals of said first zeolite by converting the silica in said extrudate to said second zeolite.

5. The catalyst recited in Claim 3, wherein the structure type of said first zeolite and said second zeolite are the same.

6. The catalyst recited in Claim 5, wherein said first zeolite is an aluminosilicate zeolite or a gallium silicate zeolite.

7. The catalyst recited in Claim 6, wherein said first zeolite and said second zeolite has a MOR structure.

8. The catalyst recited in Claim 7, wherein the average particle size of the crystals of said first zeolite is from about 1 to about 6 microns and the average particle size of the crystals of said second zeolite is from about 0.1 to about 0.5 microns.

9. The catalyst recited in Claim 8, wherein said zeolite bound zeolite catalyst contains less than 5% by weight of non-zeolitic binder based on weight of said first zeolite and said second zeolite.

10. The catalyst recited in Claim 9, wherein said second crystals are resistant to attrition.

11. A process for the alkylation of aromatic hydrocarbons which comprises contacting a feedstream containing aromatic hydrocarbon and at least one olefin under alkylation conversion conditions with a zeolite bound zeolite catalyst which does not contain significant amounts of non-zeolitic binder and comprises:

(a) first crystals of a first large pore zeolite; and,

(b) a binder comprising of a second crystals of second zeolite

12. The process recited in Claim 11, wherein said second crystals are intergrown and form at least a partial coating on said first crystals.

13. The process recited in Claim 12, wherein said first crystals of said first zeolite have an average particle size greater than about 0.1 micron and said second crystals of said second zeolite

have an average particle size that is less than said first crystals of said first zeolite.

14. The process recited in Claim 13, wherein said aromatic hydrocarbon is benzene, toluene, xylene, or mixture thereof.

15. The process recited in Claim 14, wherein said first zeolite and said second zeolite are independently selected for the group consisting of MAZ, MEI, AFI, EMT, OFF, BEA, and MOR.

16. The process recited in Claim 15, wherein said first zeolite is an aluminosilicate zeolite or a gallium silicate zeolite.

17. The process recited in Claim 16, wherein said olefin is ethylene, propylene, butene-1, trans-butene-2 and cis-butene-2, pentene, hexene, octene, nomene, decene, undecene, dodecene, tridecene, or mixtures thereof.

18. The process recited in Claim 12, wherein said second zeolite has the same structure as first zeolite.

19. The process recited in Claim 17, wherein said conversion conditions include a temperature from about 100°F to about 1000°F, a pressure from 50 to about 1000 psig, and a weight hourly space velocity from about 0.5 to about 50.

20. The process recited in Claim 18, wherein said feedstream has a molar ratio of aromatic hydrocarbons to olefins of at least 4:1.

21. The process recited in Claim 20, wherein said aromatic hydrocarbon is benzene.

22. The process recited in Claim 21, wherein said olefin is ethylene, propylene, butene-1, trans-butene-2 and cis-butene-2, pentene-1, hexene-1.

23. The catalyst recited in Claim 16, wherein said first zeolite is an aluminosilicate zeolite and has a silica to alumina ratio from 2:1 to about 150:1.

24. The catalyst recited in Claim 18, wherein the average particle size of the crystals of said first zeolite is from about 1 to about 6 microns and the average particle size of the crystals of said second zeolite is from about 0.1 to about 0.5 microns.

25. A process for the transalkylation of aromatic hydrocarbons which comprises contacting under transalkylation conversion conditions, an aromatic hydrocarbon feedstream containing a alkylaromatic hydrocarbon having from 1 to about 6 alkyl groups of from 1 to about 14 carbon atoms with a zeolite bound zeolite catalyst which does not contain significant amounts of non-zeolitic binder and comprises:

(a) first crystals of a large pore first zeolite; and,

(b) a binder comprising of a second crystals of second zeolite

26. The process recited in Claim 25, wherein said second crystals are intergrown and form at least a partial coating on said first crystals.

27. The process recited in Claim 26, wherein said first crystals of said first zeolite have an average particle size greater than about 0.1 micron and said second crystals of said second zeolite have an average particle size that is less than said first crystals of said first zeolite.

28. The process recited in Claim 27, wherein said alkylaromatic hydrocarbon is toluene, ethylbenzene dimethylbenzene,

trimethylbenze, diethylbenzene, triethylbenzene, diethylmethylbenzene, diisopropylbenzene, triisopropylbenzene, diisopropyltoluene, dibutylbenzene or mixture thereof.

29. The process recited in Claim 28, wherein said first zeolite and said second zeolite are independently selected for the group consisting of MAZ, MEI, AFI, EMT, OFF, BEA, and MOR.

30. The process recited in Claim 29, wherein said first zeolite is an aluminosilicate zeolite or a gallium silicate zeolite.

31. The process recited in Claim 30, wherein said second zeolite has the same structure as first zeolite.

32. The process recited in Claim 31, wherein said conversion conditions include a temperature from about 100°F to 1000°F, a pressure from 50 to about 1000 psig, and a weight hourly space velocity from 0.1 to 100.

33. The process recited in Claim 32, wherein said feedstream has a molar ratio of aromatic hydrocarbon to alkylaromatic hydrocarbon in the range of from about 0.5:1 to about 50:1.

34. The process recited in Claim 33, wherein said alkylaromatic hydrocarbon is toluene, dimethylbenzene, trimethylbenzene or mixtures thereof.

35. The process recited in Claim 31, wherein said first zeolite is an aluminosilicate zeolite and has a silica to alumina ratio from 2:1 to about 300:1.

36. The process recited in Claim 35, wherein the average particle size of the crystals of said first zeolite is from about 1 to about 6

microns and the average particle size of the crystals of said second zeolite is from about 0.1 to about 0.5 microns.

37. The process recited in Claim 36, wherein said catalyst contains less than 5% by weight of non-zeolitic binder based on weight of said first zeolite and said second zeolite.

38. The process recited in Claim 30, wherein said first zeolite is BEA or MAZ.

39. The process recited in Claim 30, wherein said second zeolite is a BEA or MAZ.

40. The process recited in Claim 30, wherein said first zeolite is an aluminosilicate zeolite and has a silica to alumina ratio from 2:1 to about 150:1.

41. A process for isomerizing a feed containing isomerizable monocyclic alkylaromatic hydrocarbons, bicyclic alkylaromatic hydrocarbons, or mixtures thereof comprising:

contacting said feed under isomerization conversion conditions with a zeolite bound zeolite catalyst which does not contain significant amounts of non-zeolitic binder and comprises:

(a) first crystals of a first large pore size zeolite;

(b) a binder comprising second crystals of a second zeolite.

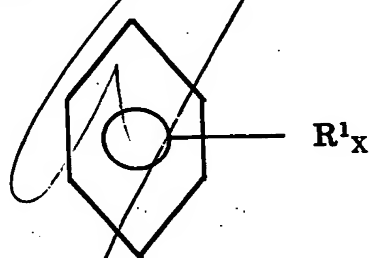
42. The process recited in Claim 41, wherein said second crystals are intergrown and form at least a partial coating on said first crystals.

43. The process recited in Claim 42, wherein said first crystals of said first zeolite have an average particle size greater than about 0.1 micron and said second crystals of said second zeolite have an average particle size that is less than said first crystals of said first zeolite.

44. The process recited in Claim 43, wherein said alkylaromatic hydrocarbons are selected from the group consisting of:

(a) a monocyclic alkylaromatic hydrocarbon represented by the formula:

I.



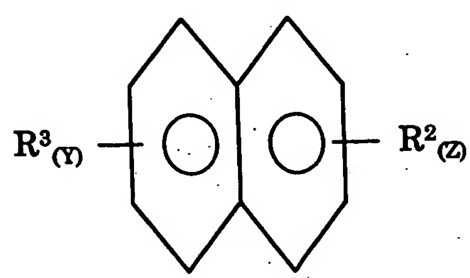
wherein:

R^1 is a alkyl group having 1 to about 4 carbon atoms; and

X is an integer of from 2 to 3; and

(b) a bicyclic alkylaromatic hydrocarbon represented by the formula:

II.



wherein

R^2 and R^3 are independently selected from an alkyl group having 1 to about 4 carbon atoms:

Y is an integer of from zero to 2;

Z is an integer of from zero to 2;

wherein the sum of Y and Z is an integer in the range of from 1 to 4; and,

(c) mixtures thereof.

45. The process recited in Claim 44, wherein the structure type of said first zeolite and said second zeolite are independently selected from the group consisting of MAZ, MEI, AFI, EMT, OFF, BEA, and MOR.

46. The process recited in Claim 45, wherein said feed comprises monocyclic alkylaromatic hydrocarbons.

47. The process recited in Claim 46, wherein R^1 is methyl or ethyl and x is 2.

48. The process recited in Claim 45, wherein said alkylaromatic hydrocarbon comprises bicyclic alkylaromatic hydrocarbons.

49. The process recited in Claim 48, wherein R^2 and R^3 are methyl, y is 1 and z is 1.

50. The process recited in Claim 46, wherein said feed is an aromatic C_8 mixture of ethylbenzene and xylene in which th paraxylene is less than at thermodynamic equilibrium.

51. The process recited in Claim 45, wherein said first zeolite is an aluminosilicate zeolite.

52. The process recited in Claim 51, wherein said first zeolite is at least partially in the hydrogen form.

53. The process recited in Claim 52, wherein said zeolite bound zeolite catalyst further comprises at least one hydrogenation metal.

54. The process recited in Claim 51, wherein said isomerization conditions comprise a temperature in the range of from about 250° to about 600°C, a pressure in the range of from about 0.2 to about 50 atm abs, a weight hour space velocity of from about 0.1 to about 100, and a H_2/HC molar ratio of between 0.1 to about 10.

55. The process recited in Claim 54, wherein said second zeolite has less acidity than said first zeolite.

56. The process recited in Claim 55, wherein said first crystals have an average particle size of from about 1 to about 6 microns.

57. The process recited in Claim 56, wherein said first zeolite is a aluminosilicate zeolite and has a silica to alumina ratio from 2:1 to about 150:1.

58. The process recited in Claim 57, wherein said catalyst contains less than 5% by weight of non-zeolitic binder based on weight of said first zeolite and said second zeolite.

59. The process recited in Claim 58, wherein said first zeolite is a MOR structure type.

60. The process recited in Claim 59, wherein said second zeolite is a BEA type.

61. The process recited in Claim 51, wherein said second crystals of said second zeolite are present in an amount in the range of from about 10 to about 60% by weight based on the weight of the first zeolite.